

# it's what's inside that counts

Ecosystems differ depending on the living and non-living things within them and how those things interact with each other. Ecosystems supply organisms with the specific food, water, shelter, air and space they need to survive. In this chapter, you will learn about the different plants, animals and non-living things in three ecosystems found in Missouri—ponds, forests and prairies.

## pond ecosystem

Don't be fooled by the quiet, peaceful appearance of a Missouri pond. A **pond**, an enclosed body of fresh water, is a busy place. A **pond ecosystem** is home to many organisms that live in or near the water. Some of the organisms that live in a pond ecosystem are fish, frogs, snakes, birds, dragonflies and plants such as cattails and duckweed.

A pond provides communities of plant and animal populations with exactly what they need to survive. Some pond organisms live in the water for all or part of their life. Other organisms may not live *in* the pond, but their survival depends on the plants and animals that do.

Water, sunlight, air, soil and temperature are non-living things.

The interaction of non-living things with plant and animal life found in every layer of a pond is important to the health of the pond ecosystem. Water-loving plants provide shelter for organisms. Even

thick, gooey mud at the bottom of a pond provides an environment rich in food and shelter for pond organisms. Tiny bits of rock in mud are non-living, but mud also contains rich nutrients for pond plants and provides places for the seeds of water plants to sprout and grow.

A pond is usually shallow enough for sunshine to reach the bottom. Sunlight warms the water and creates different layers of light. Organisms use these layers in different ways to find the food and shelter they need to survive.



Red-eared slider

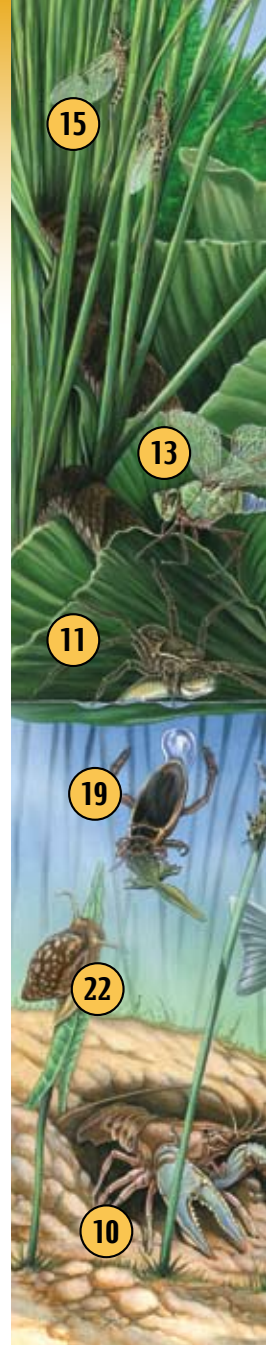


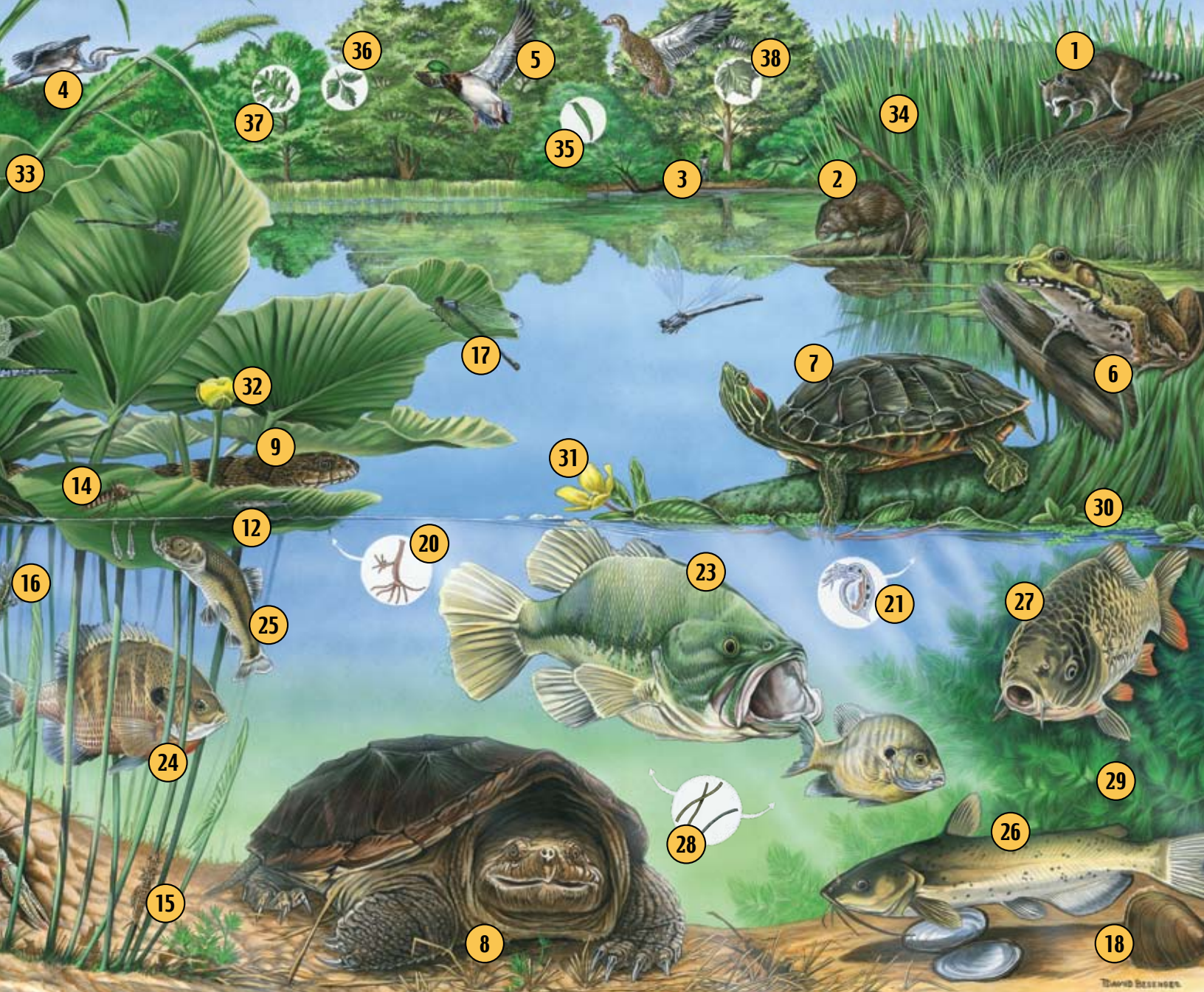
American toad

Frogs and toads both lay their eggs in the water. Frogs tend to lay eggs in globby clusters. Toads tend to lay eggs in long chains that look like strands of black pearls.



One of the smallest flowering plants, duckweed floats on pond surfaces with tiny roots hanging down into the water.





## key

- 1—Raccoon
- 2—Muskrat
- 3—Human
- 4—Great blue heron
- 5—Mallard duck
- 6—Green frog
- 7—Red-eared slider
- 8—Common snapping turtle
- 9—Northern water snake
- 10—Northern crayfish
- 11—Fishing spider
- 12—Water strider
- 13—Green darner dragonfly
- 14—Mosquito

- 15—Yellow drake mayfly
- 16—Blue-fronted dancer damselfly nymph
- 17—Blue-fronted dancer damselfly
- 18—Giant floater mussel
- 19—Predacious diving beetle
- 20—Freshwater jellyfish
- 21—Water flea
- 22—Pond snail
- 23—Largemouth bass
- 24—Bluegill
- 25—Fathead minnow
- 26—Channel catfish
- 27—Common carp
- 28—Algae
- 29—Coontail

- 30—Duckweed
- 31—Water primrose
- 32—Yellow water lily
- 33—Common sedge
- 34—Cattail
- 35—Black willow
- 36—Box elder
- 37—Pin oak
- 38—Sycamore

It may not smell nice or look pretty, but the mucky mud at the bottom of a pond is full of nutrients that keep many pond organisms alive and healthy.



## forest ecosystem

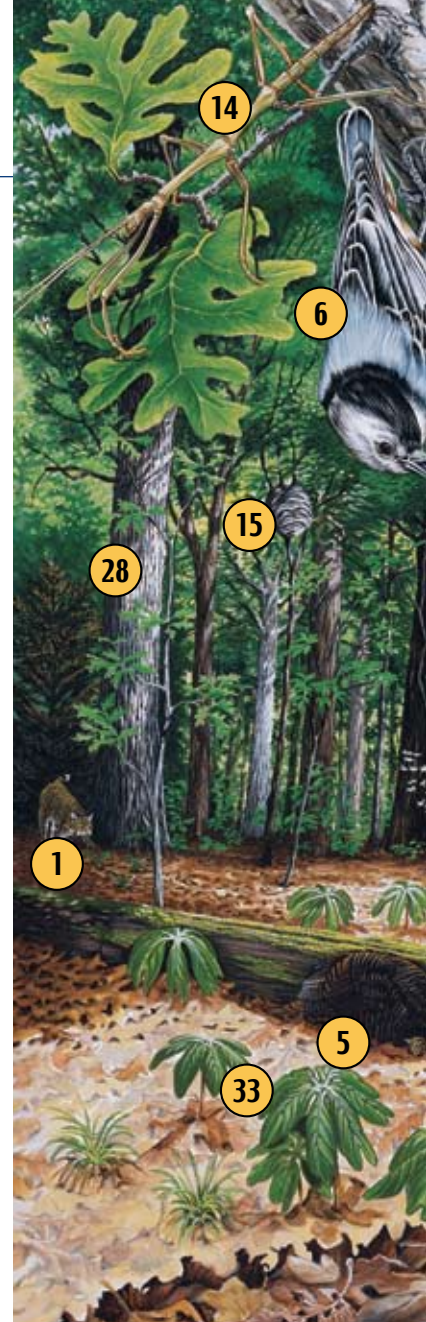
**Forests** are large areas of land covered mostly with trees, but forests are more than trees. They are communities of plants and animals that live in, around and under the trees. Soil, water, air and sunlight are some of the non-living things found in a forest ecosystem. Living things interact with the non-living things to create a **forest ecosystem**.

Forests also may appear to be quiet, but they are full of activity. A forest ecosystem extends deep below the forest floor where the roots of plants and trees compete with other organisms for nutrients, water and space in the soil. Low-growing plants and mosses, plus layers of decaying leaves, trees and branches blanket the forest floor and add nutrients to the soil.

The understory is the middle layer of the forest and consists of smaller, shade-loving trees, shrubs and vines. Branches and leaves, or the crowns, of the tallest trees make up the top layer of the forest called the canopy. The canopy provides shade to understory and forest floor plants. Trees in the canopy use energy from all the sunlight to make leaves, nuts and fruits. Energy from the leaves, nuts and fruits is passed along to forest organisms. Populations of plants and animals compete for the food, water, shelter and space found at each of these forest layers.

Savannas in Missouri are also areas of land with trees, but savannas differ from true forests. Trees in a savanna do not grow close together but are spread apart, allowing more sunlight to reach the ground.

More grasses and wildflowers are able to grow in savannas than in forests.



Spotted salamanders are secretive amphibians that live hidden under rocks or logs or in the burrows of other forest animals. In early spring, spotted salamanders return to shallow, fishless, woodland ponds to mate and lay eggs.



**Canopy**  
Crowns of the tallest trees

**Understory**  
Small trees, shrubs and vines

**Forest floor**  
Low-growing plants, layers of decaying leaves



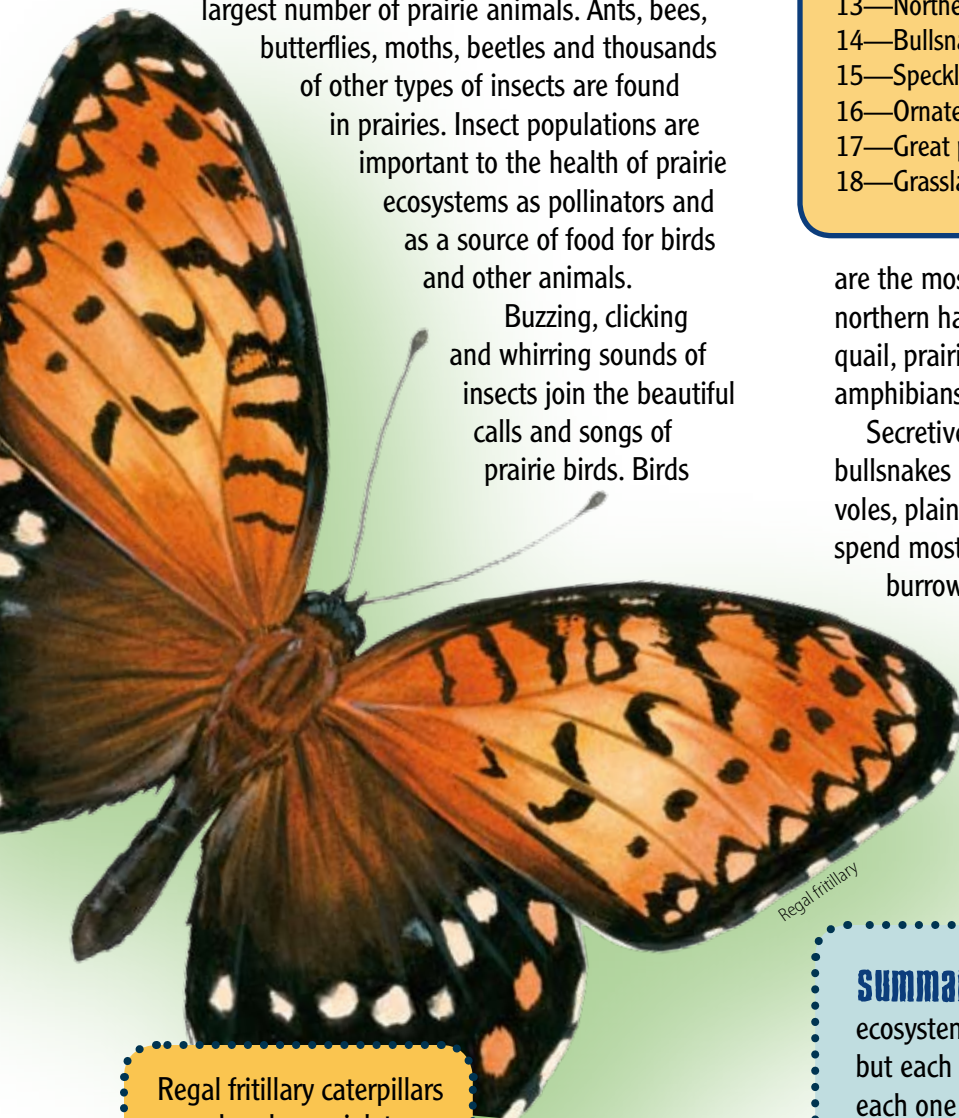
## prairie ecosystem

**Prairies** are huge grasslands with over 300 different kinds of grasses and wildflowers. These wildflowers are called forbs. You might also see a few woody shrubs on a prairie, but you would not see many trees.

Prairie communities could not exist without the grasses. Prairie grasses grow in thick clumps that animals use as shelter and nesting spots. Deep roots of prairie grasses hug and hold the soil, keeping the soil moist and holding it in place.

**Prairie ecosystems** provide everything prairie plants and animals need to survive. Plenty of sunlight, deep soil, water, shelter and food give organisms a place to grow or to raise young. Insects make up the largest number of prairie animals. Ants, bees, butterflies, moths, beetles and thousands of other types of insects are found in prairies. Insect populations are important to the health of prairie ecosystems as pollinators and as a source of food for birds and other animals.

Buzzing, clicking and whirring sounds of insects join the beautiful calls and songs of prairie birds. Birds



Regal fritillary caterpillars munch only on violets. As adult butterflies, regal fritillaries visit many prairie flowers for nectar.

Fire helps prairie grasses and forbs. When burned by fires, these plants grow back quickly and stronger.

### key

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| 1—Badger                         | 19—Regal fritillary                 |
| 2—Coyote                         | 20—Leaf beetle                      |
| 3—Spotted skunk                  | 21—Honeybee                         |
| 4—Prairie vole                   | 22—Round-winged katydid (pink form) |
| 5—Plains pocket gopher           | 23—Prairie mound ant                |
| 6—Thirteen-lined ground squirrel | 24—Prairie mole cricket             |
| 7—Greater prairie-chicken        | 25—Yellow garden spider             |
| 8—Northern harrier               | 26—Big bluestem                     |
| 9—Upland sandpiper               | 27—Little bluestem                  |
| 10—Bobwhite quail                | 28—Indian grass                     |
| 11—Bobolink                      | 29—Prairie blazing star             |
| 12—Grasshopper sparrow           | 30—Purple coneflower                |
| 13—Northern crawfish frog        | 31—Switch grass                     |
| 14—Bullsnake                     | 32—Compass plant                    |
| 15—Speckled kingsnake            | 33—Sideoats grama grass             |
| 16—Ornate box turtle             | 34—Prairie fringed orchid           |
| 17—Great plains skink            | 35—Royal catchfly                   |
| 18—Grassland crayfish            | 36—Prairie rose                     |
|                                  | 37—Blackberries                     |
|                                  | 38—Gaura                            |

are the most visible prairie animals. Prairie birds include northern harriers, upland sandpipers, bobolinks, bobwhite quail, prairie-chickens and several kinds of sparrow. Calls of amphibians such as the crawfish frog join the prairie chorus.

Secretive reptiles such as ornate box turtles and bullsnakes move silently among prairie plants, while prairie voles, plains pocket gophers and other small mammals spend most of their time hidden under the grasses or in burrows. Rabbits, coyotes and white-tailed deer also use prairies for part of their habitat needs.

Along with sunlight, water, soil, air and temperature, fire is a vital non-living part of a healthy prairie. Fire burns off trees that block sunlight from prairie plants and destroys other plants that would take over and change a prairie ecosystem.

**summary** Ponds, forests and prairies are all ecosystems found in Missouri. Each one is different, but each one has both living and non-living things and each one supports the survival of different types of plants and animals. Populations of plants and animals live in ecosystems that supply them with the food, water, shelter, air and space they need to survive.

